"Peristaltic pump"

The invention relates to a peristaltic pump, in particular for use in dishwashers for the metering of a liquid or pasty cleaning agent, with a rotating squeeze roller carrier, a squeeze hose partly looping round the squeeze rollers and a curved contact wall, which is disposed opposite the effective surface of the squeeze rollers, for the squeeze hose.

In one metering pump used by the applicant the squeeze hose is laid in a block-shaped pump body, which has a substantially semicircular edge wall, around spring-mounted squeeze rollers on a squeeze roller carrier, wherein after assembly a cover is screw-connected over this configuration, one of the counter-bearings of the squeeze roller carrier being provided in the cover. In that case it is also known to provide the squeeze hose bend, which is positioned in the pump, with coupling and detent heads which are fixed in the region of the housing outer wall in order to then connect the hoses with, for example, the dishwasher.

In the case of another solution employed by the applicant (e.g. DE 39 43 430 A1) the squeeze hose bend is accommodated in a plastics material yoke which forms the curved contact wall for the squeeze hose in the use position,

wherein the curved wall is detented with a squeeze hose, which is detented in place, after being laid around the squeeze hose rollers at the pump body. The fastening of the squeeze wall in a plane, perpendicular to the squeeze roller axis, is also shown in DE-26 57 908-B2 or DD-157 620, whereas US-4,256,442 shows the fasting of the wall through a parallel leverage with a pivot handle.

It has proved that the known designs of peristaltic pumps are still comparatively costly, wherein in the case of the first solution the exchange, which is necessary from time to time, of the squeeze hose bend is possible only by screwing on the cover, whereas in the case of the solution provided with the pivot cover a disadvantage arises, in particular, in the susceptibility of the cover to breakage and thus loss of the functional capability of the pump.

Peristaltic pumps of other construction are known from DE 33 26 766-A1 or DE-696 16 336 T2 or from DE-GM 71 47 400, to give only a few examples.

The object of the invention is to create a solution by which a simple exchange of the squeeze hose bend is made possible, without loosening any screws, and with a robust construction of all elements.

According to the invention this object is met with a peristaltic pump according to claim 1.

Because of the design of the contact wall movable by way of a pivot lever an extremely simple squeeze hose positioning is possible. The pivot lever is opened, wherein the contact wall is removed from the hose, the hose can be removed or exchanged, the pivot lever is closed and the contact wall and all other pump elements are disposed in the working position. At the same time it is achieved by this design that on closing the pump housing cover the contact wall, which is integrally formed therewith, is simultaneously displaced into the working position.

Embodiments of the invention are evident from the subclaims.

According to the invention the squeeze roller carrier together with the squeeze rollers is positioned at a housing base, wherein support detents for receiving pivot cams of the setting lever are provided at the housing base. In that case it can be advantageous in a further embodiment if guides for receiving slide rails at the housing cover are provided at the housing base.

It can be advantageous if an end wall with a detent tongue

as well as with two substantially U-shaped recesses for passage of the squeeze hose is provided at the housing base, wherein in a further embodiment it can be provided that the setting lever is constructed as a yoke with counter-detent for detenting at the detent tongue in the housing closed setting. In that case it is possible to provide with the same detent element a carrier not only for the squeeze hose bend, but also for the setting lever or setting yoke.

The squeeze hose can be provided at a hose carrier or, however, can be positioned as an individual element in corresponding detent recesses in the housing end wall, which is equally proposed by the invention.

Further advantages, details and features of the invention are evident from the following description as well as on the basis of the drawing, in which:

Figs. 1 to 4 show, in perspective illustration, different positions of the pump head of the peristaltic pump from the unlocked setting up to the squeeze hose withdrawal setting and

Fig. 5 and 6 show a cross-section through the housing of the pump head in unlocked and locking

setting.

Of the peristaltic pump according to the invention, there is illustrated in the figures the pump head; the corresponding drives are not further depicted here.

The pump head denoted generally by 1 comprises a base element 2 whith an integrally formed end wall 3 and two side walls 4 which are in turn integrally formed therewith, as well as a housing cover 6 which is displaceable by way of a pivot lever 5, and which in turn has integrally formed side wall surfaces 7 parallel to the side wall surfaces 4 of the base part. The side wall surfaces 7 of the housing cover have, at the lower outer edge thereof, integrally formed slide rails 8 which are displaceably guided in corresponding counter rails or grooves in the region of transition from the base of the side wall surfaces 4.

As evident particularly from Fig. 2, the pivot yoke 5 is pivotably mounted at the cover 6 by way of inwardly pointing hinge pins 9, wherein outwardly pointing pins 10 can bear against pivot projections 11 which are integrally formed at the side walls 4 of the base part to pint inwardly.

A rotor 12 (Fig. 4) with three squeeze rollers 13, which

can be brought into rotation by a drive which is not illustrated in more detail, is detented in the base element 2. As illustrated in Fig. 3 and 4, a squeeze hose bend 14 is fixed by the coupling projections 15 in a squeeze hose carrier 16, which can be detented with or released from the front side 3 by way of sliding guides, wherein the connections 15 project outwardly beyond the entire housing.

At this point it is to be noted that the squeeze hose bend 14 is fixable also as an individual element by way of alternatively provided slots 17 in the carrier plate 16 or directly in the slots 18 in the end wall 3, depending on the respective construction. The cover 6 has, in the interior, the contact wall 19 for the squeeze hose 14, wherein this contact wall 19 presses the squeeze hose 14 against the squeeze roller 13 by way of pivotation in accordance with arrow 20 in Fig. 5, as is evident from Fig. 6, which shows the pump head in closed setting, i.e. the cover 6 is displaced in accordance with arrow 21 from the position illustrated in Fig. 5 to the closed position illustrated in Fig. 6.

The end wall 3 is beyond that furnished with a detent element 22 which co-operates with a detent counter-element 23 at the pivot yoke 5 and detents all elements together in the closed setting.

It can be seen that an exchange of the squeeze hose bend 14 subjected to wear is extremely simple:

From the closed setting illustrated in Fig. 6, the pivot lever 5 is pivoted upwardly, whereby solely through the resilience of the squeeze hose 14, which bears against the contact wall 19, the cover 6 is displaced to the right in the figures, at least into the slightly open position illustrated in Fig. 1. If the pivot lever is now pivoted somewhat further and releases the contact cam 11, the cover can be withdrawn from the housing base 3 by way of the slide rails 8, this position being illustrated in Fig. 3, wherein at the same time the squeeze hose bend 14 is freed so that the squeeze hose carrier 16 together with the squeeze hose 14 can be withdrawn upwardly, as is depicted in Fig. 4. After placing a new squeeze hose bend 14 around the squeeze rollers 13, there takes place a pushing together of the elements and finally locking in the working position illustrated in Fig. 6.